

WHAT IS CLAIMED IS:

1. A method of determining the state of a telephony call, comprising the steps of:
providing a trained artificial neural network system for determining call progress
tones from an input signal associated with said telephony call; and

5 employing said trained neural network system for determining the call progress tones
and the state of said telephony call based on determined call progress tones.

2. The method of claim 1 wherein said trained neural network system determines
the call progress tones in presence of near end speech to optimize talkoff and talkdown
performance.

3. The method of claim 1 further comprising the step of providing one or more
call options to a caller based on the determined state of said telephony call.

4. The method of claim 1 wherein said artificial neural network system is
implemented in hardware.

5. The method of claim 1 wherein said artificial neural network system is
implemented in software.

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✓ 6. A method for providing an artificial neural network system for determining the state of a telephony call, comprising the steps of:

providing an artificial neural network system for determining call progress tones from an input signal associated with said telephony call; and

5 training said artificial neural network system using a telephone network simulator to determine call progress tones from a plurality of signals.

7. The method of claim 6 wherein the step of training comprises the step of back-propagating an error indicative of whether the call progress tones were properly determined.

8. The method of claim 6 wherein said plurality of signals comprises call progress tones mixed with audio from Bellcore's ADSI test tapes.

9. The method of claim 6 wherein the step of training comprises the step of sampling said plurality of signals at 100 samples/second to train said artificial neural network system.

10. The method of claim 6 wherein the step of training comprises the step of adjusting one or more artificial neural network parameters until an error rate is at or below a predetermined error rate.

11. The method of claim 10 wherein said parameters include at least one of the following: learning rate and number of hidden nodes.

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12. Apparatus for determining the state of a telephony call, comprising:
a trained neural network system for determining the call progress tones from an input signal associated with said telephony call and the state of said telephony call based on the call progress tones.

13. The apparatus of claim 12 wherein said trained neural network system determines the call progress tones in presence of near end speech to optimize talkoff and talkdown performance.

14. The apparatus of claim 12 wherein said neural network is operable to provide one or more call options to a caller based on the determined state of said telephony call.

15. The apparatus of claim 12 wherein said artificial neural network system is implemented in hardware.

16. The method of claim 12 wherein said artificial neural network system is implemented in software.

17. Apparatus for providing artificial neural network system for determining the state of a telephony call, comprising:

an artificial neural network system for determining call progress tones from an input signal associated with said telephony call; and

means for training said artificial neural network system using a telephone network simulator to determine call progress tones from a plurality of signals.

18. The apparatus of claim 17 wherein said means for training is operable to back-propagate an error indicative of whether the call progress tones were properly determined.

19. The apparatus of claim 17 wherein said plurality of signals comprises call progress tones mixed with audio from Bellcore's ADSI test tapes.

20. The apparatus of claim 17 wherein said means for training is operable to sample said plurality of signals at 100 samples/second to train said artificial neural network system.

21. The apparatus of claim 17 wherein said means for training is operable to adjust one or more artificial neural network parameters until an error rate is at or below a predetermined error rate.

22. The method of claim 21 wherein said parameters include at least one of the following: learning rate and number of hidden nodes.